

Operating Manual

English



ML71BS6

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Subject to modifications.
All product descriptions are for general information only.
They are not to be understood as a guarantee of quality or
durability.

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1 Safety instructions

Use in accordance with the regulations

The ML71BS6 CAN bus module is to be used exclusively for measurement tasks and directly related control tasks. Use for any purpose other than the above shall be deemed to be not in accordance with the regulations.

To ensure safe operation, the device may only be operated in accordance with the information given in the Operating Manual. It is also essential to comply with the legal and safety requirements for the application concerned during use. The same applies to the use of accessories.

General dangers of failing to follow the safety instructions

The ML71BS6 CAN bus module complies with the state of the art and is fail-safe. The device may give rise to further dangers if it is inappropriately installed and operated by untrained personnel.

Any person instructed to carry out installation, commissioning, maintenance or repair of the device must have read and understood the Operating Manual and in particular the technical safety instructions.

Remaining dangers

The scope of performance and supply of the ML71BS6 only covers part of the range of measurement technology. In addition, equipment planners, installers and operators should plan, implement and respond to the safety engineering considerations of measurement technique in such a way as to minimise remaining dangers. Prevailing regulations must be complied with at all times. There must be reference to the remaining dangers connected with measurement technique.

Working safely

Error messages must only be acknowledged when the cause of the error has been removed and no further danger exists.

The device complies with the safety requirements of DIN EN 61010-Part 1 (VDE 0411-Part 1); Protection Class I.

To ensure adequate immunity from interference, use only *Greenline* shielded ducting (see HBM offprint "Greenline shielding design, EMC-compliant measuring cable; G36.35.0)

Conversions and modifications

No modifications that affect the design or the technical safety of the ML71BS6 CAN bus module may be carried out without our express agreement. Any modification shall exclude all liability on our part for any resulting damage.

In particular any repair or soldering work on motherboards is prohibited. When exchanging complete modules, use only original parts from HBM.

Qualified personnel

This instrument must only to be installed and used by qualified personnel, strictly in accordance with the technical data and the safety requirements and regulations listed. It is also essential to comply with the legal and safety requirements for the application concerned during use. The same applies to the use of accessories.





Qualified personnel means persons entrusted with the installation, assembly, commissioning and operation of the product who possess the appropriate qualifications for their function.

Maintenance and repair work on an open device with the power on must only be carried out by trained personnel who are aware of the danger involved.

2 Markings used

2.1 The markings used in this document

Important instructions for your safety are specifically identified. It is essential to follow these instructions in order to prevent accidents and damage to property.

Symbol	Significance
	This marking draws your attention to a situation in which failure to comply with safety requirements <i>can</i> lead to damage to property.
 Important	This marking draws your attention to <i>important</i> information about the product or about handling the product.
 Tip	This marking indicates application tips or other information that is useful to you.
 Information	This marking draws your attention to information about the product or about handling the product.
<i>Emphasis</i> <i>See....</i>	Italics are used to emphasize and highlight text and references to other chapters and external documents.

2.2 Symbols on the product

CE mark



The CE mark enables the manufacturer to guarantee that the product complies with the requirements of the relevant EC directives (the declaration of conformity is available at <http://www.hbm.com/HBMdoc>).

3 Introduction

The ML71BS6 is an *MGCplus* system module that takes measurement data from the MGC and outputs it as CAN messages. It records up to 128 measured values per CAN port, scales them and outputs them at the CAN bus.

Two independent CAN interfaces per channel and two different physical layers (ISO 11898-24V and a "low-speed" link based on the Philips TJA1053 transceiver module) are supported.

The measurement data to be transmitted can be selected either by using the AB22A/AB32 display and control panel or by using the "*MGCplus Assistant*" software from HBM.

4 Connections

4.1 Pin assignment

The CAN bus is connected to the AP71 connection board by a 9-pin Sub-D connector. You can connect two independent CAN field bus systems (CAN1 and CAN2). Both the CAN interfaces are used to output the MGC*plus* measurement data. Each of the interfaces can be assigned up to 128 measured values.

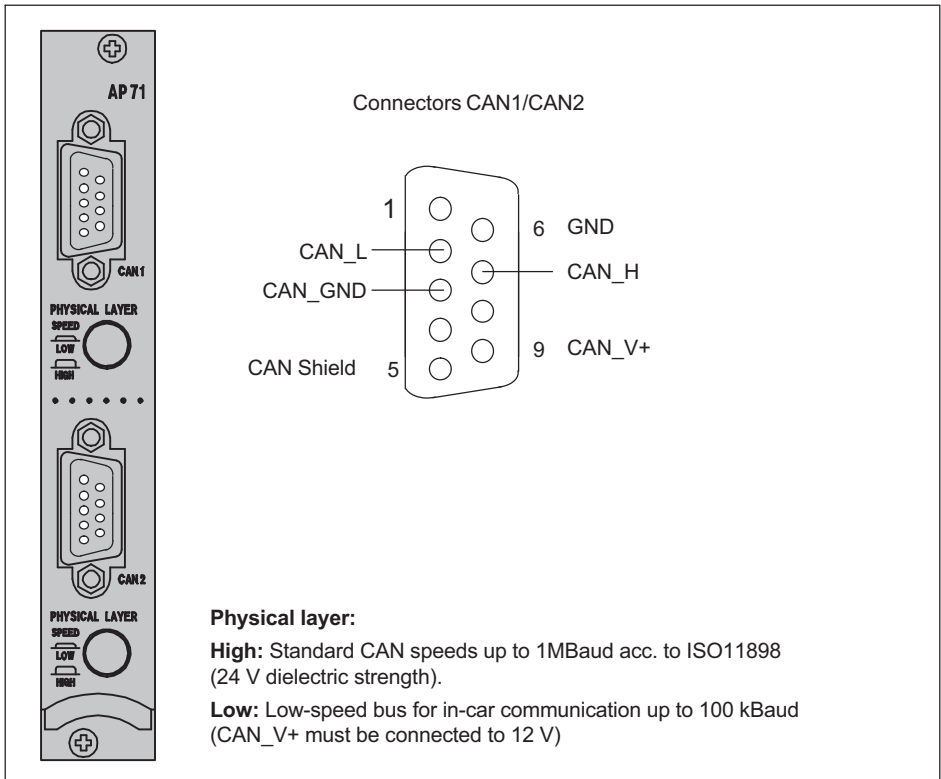
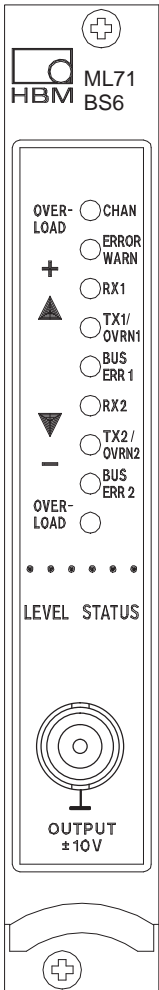


Fig. 4.1 CAN connection

5 Front panel



The front panel LEDs have a dual function:

In Level mode, the signal level at the analogue output is displayed.

In Status mode, the LEDs are assigned as shown below:

LED caption	Colour	Meaning in Status mode
CHAN.	yellow	Channel selected
ERROR/WARN.	red	error/warning
Rx1	-	not used
Tx1/OVRN1	red/yellow	CAN protocol transmitted
BUSERR1	red	Bus error at CAN1
Rx2	yellow	not used
Tx2/OVRN2	red/yellow	CAN protocol transmitted
BUSERR2	red	Bus error at CAN2

Analog output (BNC connector (female))

Any voltage from -10 V to +10 V can be output through the female BNC connector by interface command.

6 Parameterization

6.1 Settings CAN1 /CAN2

The baud rate, the transmission formats, the number of signals and the output rate of the 1st CAN bus are set here. The same menu is applied correspondingly to the 2nd CAN bus.

The maximum number of signals for a bus is 128 signals.

The following output rates are offered for selection depending on the number of output signals. In the case of the 2nd CAN port, please note that the maximum possible output rates can only be achieved if no signals have been selected at CAN port1.

If a selected rate cannot be achieved, the messages will be output as quickly as possible and an error message will be generated. Transmission will then not be at a fixed frequency.

Number of signals		Format	Output rate [Hz]	
CAN1	CAN2		Port1	Port2
4	4	INT16	2400	800
4	4	INT32	2400	600
4	4	Float32	2400	400
8	8	INT16	1200	800
8	8	INT32	1200	400
8	8	Float32	1200	300
16	16	INT16	600	600
16	16	INT32	600	300
16	16	Float32	600	300

The first ID of a range can be set. The last ID is derived from this and from the number of signals.

1. Use the shift key (SET) to change to set-up mode and then press the function key (F4). Use the cursor keys to select "Settings CAN1" and confirm with (←).

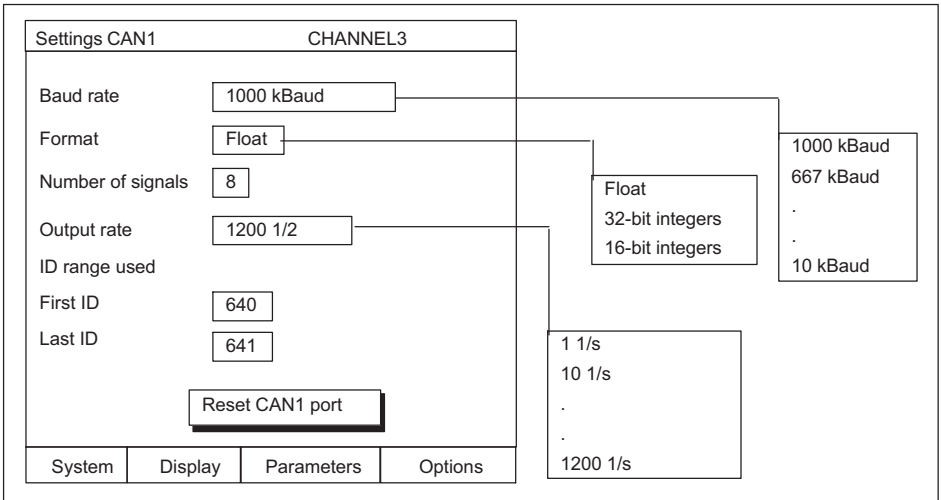


Fig. 6.1 CAN1 / CAN2 dialog window

2. Use the cursor keys (↑↓) to choose the baud rate selection field. Use (←) to call the selection list and choose the desired baud rate. Confirm with (←).
3. Select the output rate in the same way as for 2.
4. Use the cursor keys (↑↓) to select the "Number of signals" edit field and enter the desired figure.
5. Select the output rate in the same way as for 2.
6. Use the cursor keys (↑↓) to select the "First ID" edit field and enter the desired figure. The "Last ID" edit field is set automatically.

- Use the shift key (SET) to change to measuring mode and confirm the follow-up question with (←→).

6.1.1 Panel output signals CAN 1

This is where to set the sources for the signals to be transmitted and if necessary, scaling for the output values.

- Use the shift key (SET) to change to set-up mode and then press the function key (F3). Use the cursor keys to select “Sources CAN1” and confirm with (←→).

Format 1; Absolute values Float

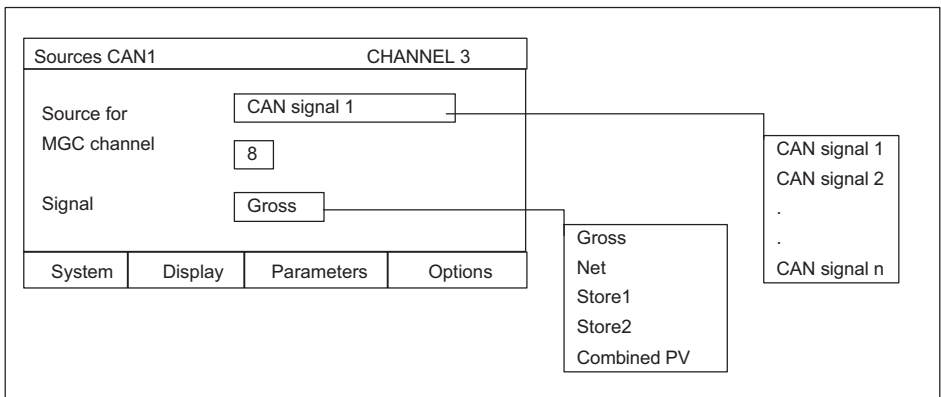









Fig. 6.2 CAN1 / CAN 2 output signals dialogue window

- Use the cursor keys (↑↓) to select the “Source for MGC channel” selection field. Use (←→) to call the selection list and choose the desired CAN signal. Confirm with (←→).

3. Use the cursor keys  to select the MGC channel field and enter the desired channel (e.g. 8.1).
4. Use the cursor keys  to select the “Signal” edit field. Use  to call the selection list and choose the desired signal. Confirm with .

Formats 2 and 3; 32-bit integers and 16-bit integers

You must also specify scaling here.

1. Use the shift key  to change to set-up mode and then press the function key . Use the cursor keys to select “Sources CAN1” and confirm with .

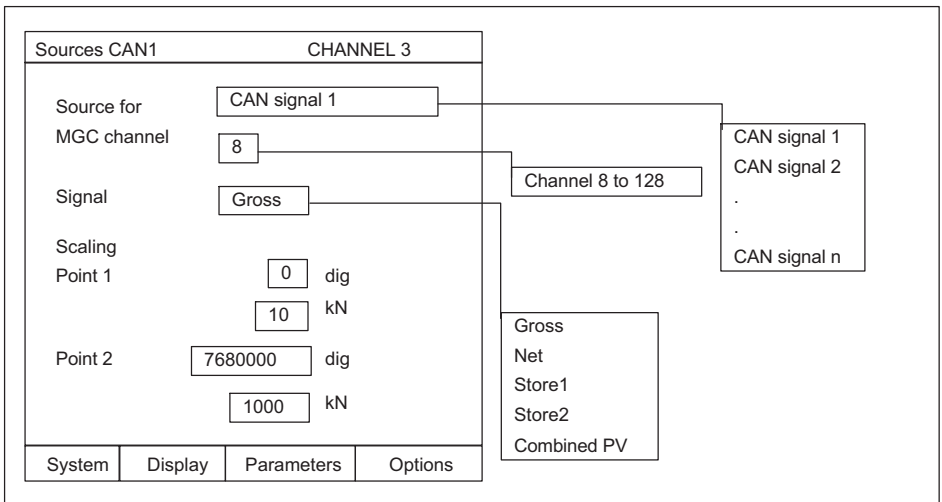















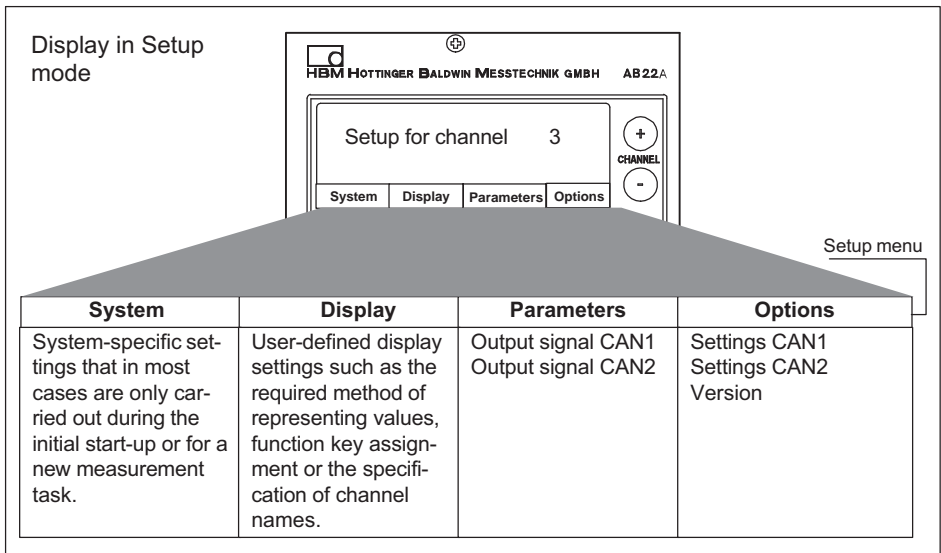
Fig. 6.3 CAN1 / CAN 2 output signals dialogue window

2. Use the cursor keys  to select the “Source for MGC channel” selection field. Use  to call the selection list and choose the desired signal. Confirm with .

3. Use the cursor keys  to select the MGC channel field and enter the desired channel (e.g. 8.1).
4. Use the cursor keys  to select the “Signal” edit field. Use  to call the selection list and choose the desired signal. Confirm with .
5. Use the cursor keys  to select the “Point 1” edit field and enter the digit value.
6. Use the cursor keys  to select the next edit field and enter the value of the accompanying physical unit.
7. Use the cursor keys  to select the “Point 2” edit field and proceed in the same way as for points 5 and 6.
8. Use the shift key  to change to measuring mode and confirm the follow-up question with .

7 Menu structure in set-up mode

The set-ups for the MGC*plus* unit are subdivided into groups according to their function. Pressing the shift key  takes you to the set-up dialogue, and the selection bar is displayed.



You will find more notes on working with the AB22A display and control panel in the “MGC*plus* with AB22A/AB32” manual.

8 CAN protocol

Up to 128 measured values can be transmitted at each bus.

A number of signals is assigned to each bus. This determines the signal transmission rate at the particular CAN port (in the case of CAN port 2, the operating mode of CAN port 1 is also a factor).

8.1 Measurement signal transmission

The operating priority for the two CAN ports is different. CAN port 1 always takes priority, to ensure that the transmission pattern of the data sent from here is exactly periodic. When sending a synch signal, the values sent thus far are valid here. CAN port 2 has the lower priority. Measurement signals can be transmitted in the following three formats.

8.1.1 Absolute values in Float

In each 8-byte CAN message, 2 signals are transmitted as Float values (32-bit). This is dealing with scaled measured values.

8.1.2 In digits as Long

In each CAN message, 2 of these values are transmitted as Long (32-bit), with the MSByte¹ always being 0. Digital value scaling can be preset by using two point calibrations.

8.1.3 In digits as Word

In each CAN message, 4 of these values are transmitted as Words (16-bit). Digital value scaling can be preset by using two point calibrations.

8.1.4 Identifier assignment

Default assignment

The possible formats are sent out for the same signal under different identifiers, so that fixed scaling can be assigned in the receiver of a specific ID. The synch message at CAN port 1 has the identifier $80h^2$) and does not contain any data bytes.

1) Most significant byte

2) This hexadecimal number corresponds to the decimal value 128

Measurement data messages CAN port 1

Absolute values in Float (identifier: default values)

Identifier	8-byte data field	
0x200-0x23F	4-byte measured value 1 (absolute Float)	4-byte measured value 2 (absolute Float)

In digits from 7680000 (= 24-bit) as Long

Identifier	8-byte data field	
0x240-0x27F	4-byte measured value 1 (signed integers in digits from 7680000)	4-byte measured value 1 (signed integers in digits from 7680000)

In digits from 30000 (= 16-bit) as Word

Identifier	8-byte data field			
0x280-0x29F	2-byte measured value 1 (signed integers in digits from 30000)	2-byte measured value 1 (signed integers in digits from 30000)	2-byte measured value 1 (signed integers in digits from 30000)	2-byte measured value 1 (signed integers in digits from 30000)

Measurement data messages CAN port 2

Absolute values in Float

Identifier	8-byte data field	
0x300-0x33F	4-byte measured value 1 (absolute Float)	4-byte measured value 2 (absolute Float)

In digits from 7680000 (= 24-bit) as Long

Identifier	8-byte data field	
0x340-0x37F	4-byte measured value 1 (signed integers in digits from 7680000)	4-byte measured value 1 (signed integers in digits from 7680000)

In digits from 30000 (= 16-bit) as Word

Identifier	8-byte data field			
0x380-0x39F	2-byte measured value 1 (signed integers in digits from 30000)	2-byte measured value 1 (signed integers in digits from 30000)	2-byte measured value 1 (signed integers in digits from 30000)	2-byte measured value 1 (signed integers in digits from 30000)

Adjusting the ranges

As a variant to the default setting, you can choose the start of the ID range you are using for the selected format at the particular CAN bus.

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